

THE GENUS ENDEODES LECONTE

(Coleoptera, Melyridæ)

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The insect fauna of the inter-tidal area of the Pacific Coast has received little attention by entomologists, though it presents many features of exceptional interest. In the Coleoptera Dr. E. C. Van Dyke has described three new inter-tidal species from our coast representing three families.¹ Messrs. Ferris and Chamberlin have treated our species of *Liparocephalus* and *Diaulota*,² and Saunders³ has reported the general habits of two of these. The present paper records a genus which, though originally described from the seashore, has never been reported as inter-tidal. The family Melyridæ is quite generally found on flowers, but this genus, *Endeodes* LeConte, is found only in the rubbish on the beaches of our coast.

Two species of *Endeodes* were first described by LeConte from San Diego and one from San Francisco and they were placed in the European genus *Atelestus* Erichson. Later LeConte recognized and named the genus *Endeodes* for his three American species. Since then nothing has been added to the knowledge of the genus. Two new species are here recorded, bringing the total to five.

The species fall readily into two groups, probably not deserving of subgeneric rank. The species *basalis* and *abdominalis* belong to one group, and the species *insularis*, *collaris* and *rugiceps* belong to the other, as indicated by the elytra, genitalia, and shape of the prothorax (Fig. 3).

As far as I can learn, all other persons who have collected these beetles have taken it for granted that they live under rubbish on the beach above high tide mark. With few exceptions, the sixty specimens I have collected, from San Francisco to San Diego, have been found near high tide mark but defi-

¹ Van Dyke, E. C. New Inter-Tidal Rock Dwelling Coleoptera from California, *Ent. News*, XXIX, 303-308, 1918.

² Chamberlin, J. C., and Ferris, G. F. On *Liparocephalus* and Allied Genera, *Pan-Pac. Ent.*, V, 137-143, 153-162, 1929.

³ Saunders, L. G. Some Marine Insects of the Pacific Coast of Canada, *Ann. Ent. Soc. Am.*, XXI, 521-545, 1928.

nitely in the damp areas wet regularly by high tides. They were all found under rubbish, especially boards.

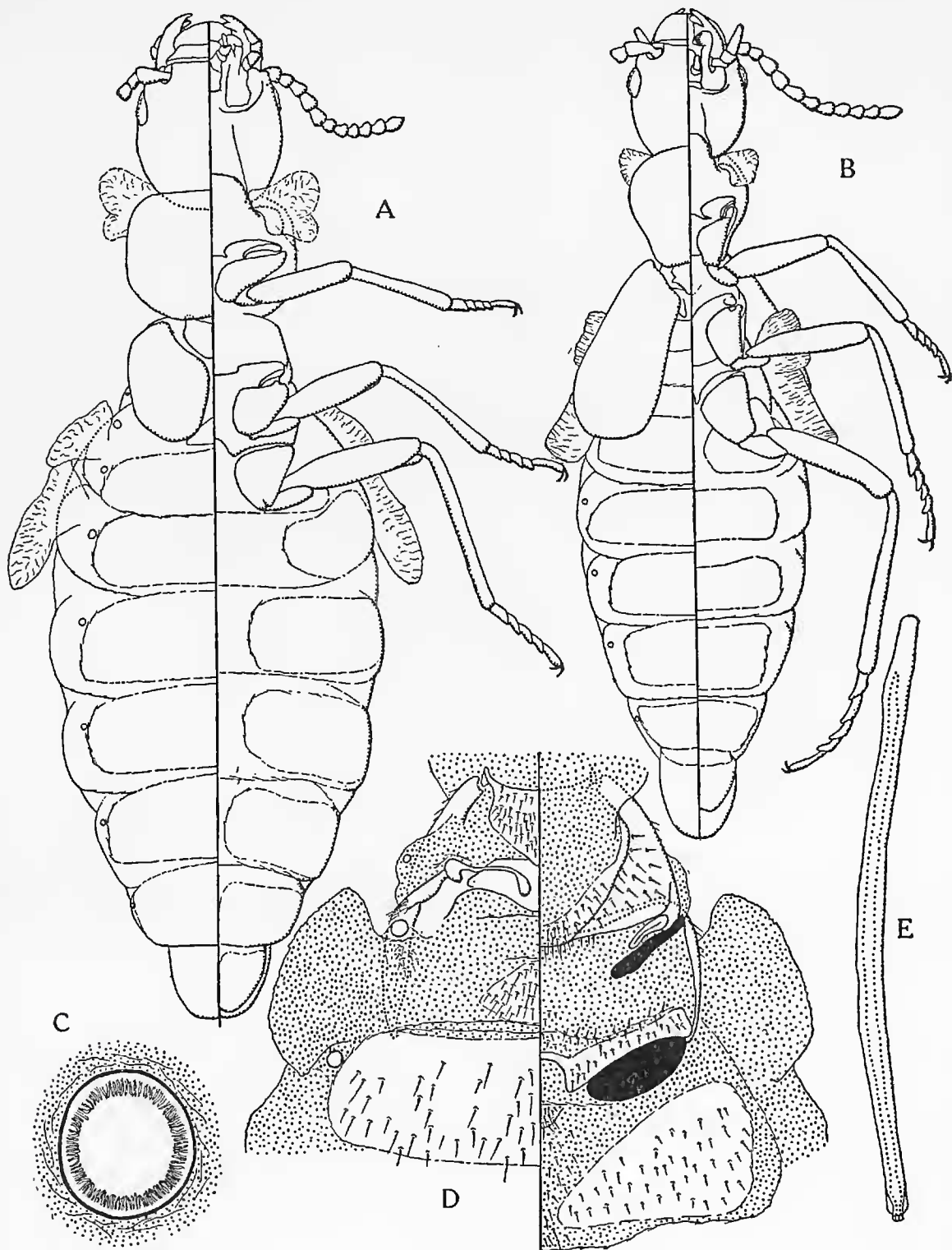


Figure 1. *Endeodes collaris* (LeConte); A, female, outline of body, vesicles extended, setæ omitted; C, first abdominal spiracle; D, details of meso- and metathorax, elytra and legs removed; E, spermatheca. *Endeodes basalis* (LeConte); B, female, outline.

Mr. E. P. Van Duzee and Mr. J. O. Martin of the California Academy of Sciences have greatly aided me by the loan of material and by other kindnesses, and Drs. E. C. Van Dyke and F. E. Blaisdell, Sr., have very kindly given permission for me to use the specimens in their collections. Professor G. F. Ferris of Stanford University has been very liberal with his help and advice, and has discussed with me many of the problems of morphology, interpretations, et cetera.

Endeodes is a genus of Melyridæ referable to the subfamily Malachiinæ and therefore characterized by the presence of extensile membranous vesicles on the prothorax and between the metathorax and the abdomen. It is distinguished from the other genera of the sub-family by the following characters: Wings completely lacking; elytra not exceeding one-half the length of the abdomen; antennæ 11-segmented; tarsi 5-segmented in both sexes, second segment of the fore tarsi of the male expanded and prolonged over the third segment and terminated by a comb of stout, black setæ.

Type of the genus, *Atelestus basalis* LeConte. The type specimen is in the LeConte Collection in the Museum of Comparative Zoölogy at Cambridge, Massachusetts, along with the types of the other two species of LeConte.

Since the characters of this genus have never been published, some of the outstanding features are included here. The general form (Fig. 1 A, B) and appearance is very similar to that of the Staphylinidæ.

The head is strongly depressed and nearly round. The antennæ (Fig. 2 A) are 11-segmented, in contrast to the ten segments found in certain other genera, but present no features of special interest, there being none of the secondary sexual modifications found in the related genus Collops. The labrum is broadly oval and distinct from the clypeus, which is likewise distinctly separated from the front. The mandibles (Fig. 2 E) are stout and strongly two-toothed, with a small membranous lobe or prostheca at the base of the inner face. The maxilla (Fig. 2 C) consists of two flat lobes, the lacinia and galea, the latter consisting of two flat segments, the maxillary palpi are four-segmented. The labium (Fig. 2 D) is small, the mentum quadrate, the prementum not separated from the ligula or the palpi-gers, the labial palpi three-segmented.

The prothorax varies considerably in form (Fig. 3 M, N, O, P), the sides of the pronotum not margined, but sometimes deflexed.

The prosternum is short, not separating the coxæ, but with extensile membranous vesicles issuing from a slit on each side near the anterior angles. The coxal cavities are large, confluent and open behind. The mesosternum is short, not separating the coxæ, with the episterna attaining the coxæ. The metasternum is short, very slightly prolonged between the posterior coxæ and more or less notched at tip. The mesothoracic and metathoracic spiracles are present though small, the former being in the membrane between the mesothorax and the prothorax and drawn up inside the prothorax. The elytra are variable in size and shape (Fig. 3 I, J, K, L), but are never more than half as long as the abdomen and always meet down

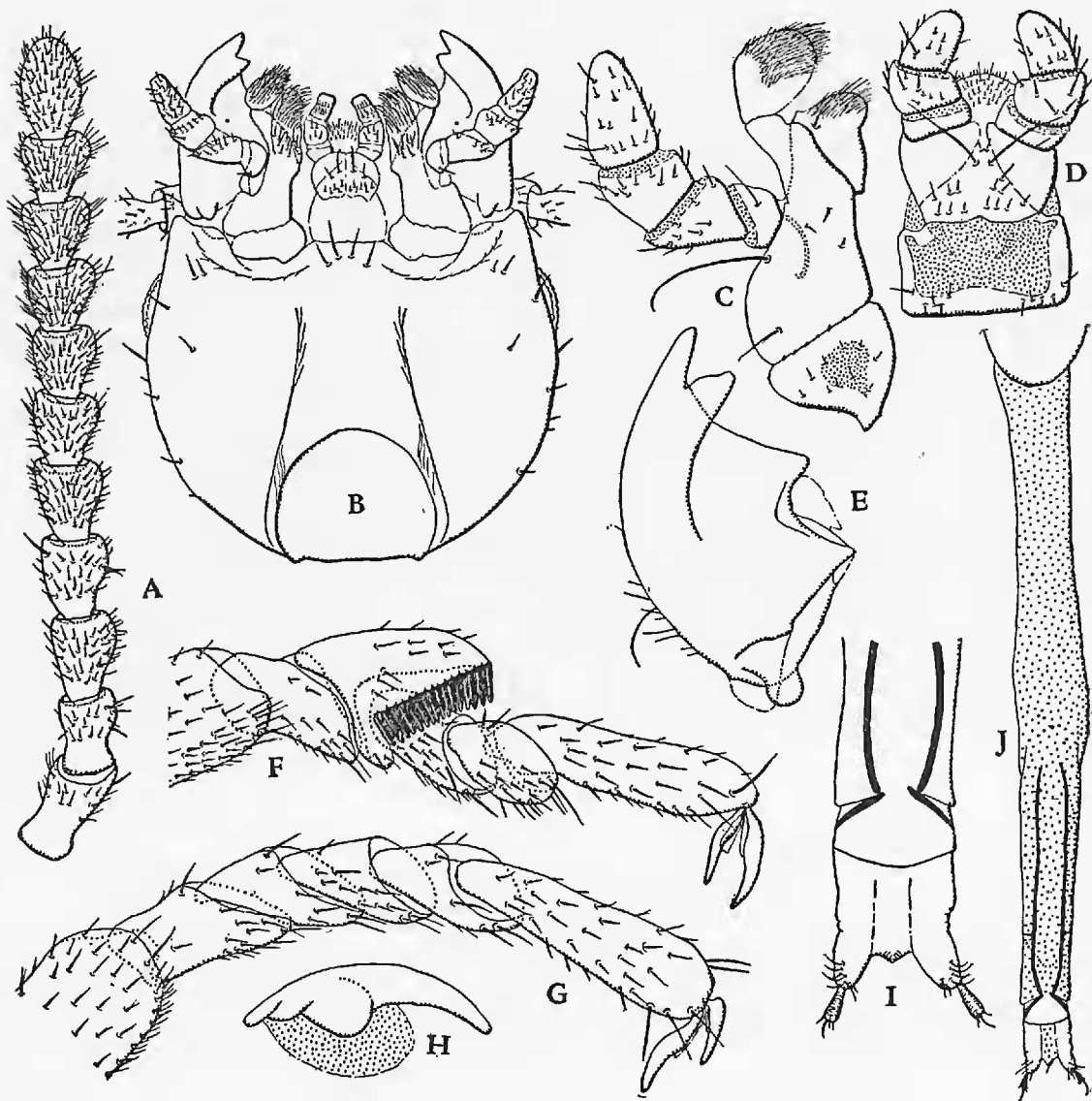


Figure 2. *Endeodes collaris* (LeConte); A, antenna; B, ventral aspect of head; C, details of maxilla; D, details of labium; E, mandible, showing membranous lobe; F, anterior tarsus of male, with comb of setæ; G, anterior tarsus of female; H, detail of claw, showing membranous appendage; I, details of tip of female genitalia; J, female genitalia.

the center for at least part of their length. They are coarsely punctate with the surface irregularly channeled between the punctures. The hind wings are entirely absent. The legs (Fig. 2 F, G) are moderately long and slender; the coxæ large, prominent and conical; the trochanters are distinct; tibiæ without distinct spurs; anterior tarsi of male with the second segment prolonged in a curved lobe over the third and the base of the fourth, the lobe bearing a comb of stout setæ around its terminal edge; middle and posterior tarsi of male and all tarsi of female normal, each segment prolonged slightly under the base of the next, and decreasing in size from the first to the fourth segment, the fifth being at least as long as the third and fourth together. The claws (Fig. 2 H) are small, each bearing a large inferior membranous appendage.

The abdomen, exclusive of the genitalia, consists of eight segments, only six ventral segments being visible. Seven pairs of abdominal spiracles are present (Fig. 1 C), the first pair not enlarged. They are situated in the membranes between the tergites and the sternites, no paratergites (pleurites) being present. The vesicles of the abdomen (Fig. 1 A) arise from the same region between the first and second and the second and third segments. The genitalia of the male (Fig. 3 A, B, D, E, F) consist of a long and tubular median lobe and a tegmen forming a cap-piece on the dorsal face, the basal angles meeting together beneath the median lobe, forming a ring; the central part of the cap-piece is membranous; and the tip of the median lobe is armed with very fine recurved spines (Fig. 3 C). The genitalia of the female (Fig. 3 J) have two small styli borne on the end of the coxite, which shows apparent secondary division; each valvifer is reduced to a long baculum articulating with a short baculum in the base of the coxite (Fig. 3 I); the paraproct is also reduced to a baculum. A spermatheca is present in the females in the form of a long tube (Fig. 1 E). The pygidium of the female (Fig. 3 G, H) varies slightly in form and in the extent of the sternal area.

The new species *E. rugiceps* Blackwelder differs from *E. collaris* (LeConte) chiefly in color. But color seems to be very constant in all the species and is the easiest character for separating them. It can be used either for dried specimens or for those cleared and mounted on slides.

KEY TO THE SPECIES OF ENDEODES

1. Elytra nearly half as long as abdomen, black with base pale..... 2
 Elytra much less than half as long as abdomen; of one color
 throughout 3
2. Abdomen yellow or fuscous*basalis*
 Abdomen black*abdominalis*
3. Legs, antennæ, and mouthparts darker than thorax..... 4
 Legs, antennæ, and mouthparts pale.....*insularis*

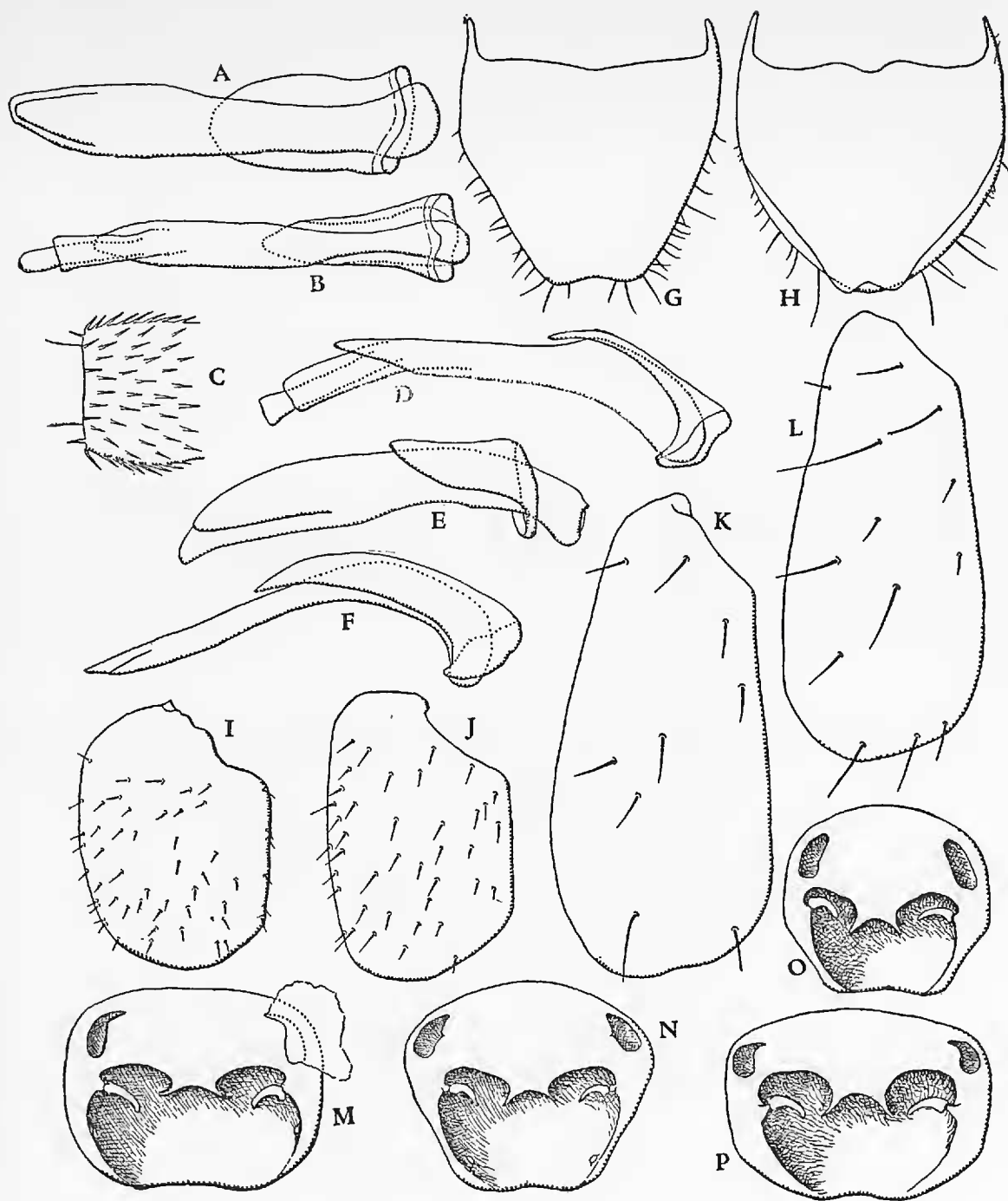


Figure 3. *Endeodes abdominalis* (LeConte); A, ventral aspect of male genitalia; K, left elytron of male; N, ventral aspect of prothorax, legs removed. *Endeodes basalis* (LeConte); E, lateral aspect of male genitalia; L, left elytron of female; O, ventral aspect of prothorax, legs removed. *Endeodes insularis* Blackwelder; F, lateral aspect of male genitalia; J, left elytron of male; P, ventral aspect of prothorax. *Endeodes collaris* (LeConte); B, ventral aspect of male genitalia; H, ventral aspect of pygidium of female; I, left elytron of male; M, ventral aspect of prothorax. *Endeodes rugiceps* Blackwelder; G, ventral aspect of pygidium of female.

4. Head black.....*collaris*
 Head reddish.....*rugiceps*

ENDEODES BASALIS (Lec.)

Fig. 1 B. Entire body pale; elytra black with a small reddish patch at the base. Head round, prothorax about as long as wide (Fig. 3 O). Elytra (Fig. 3 L) nearly half as long as the abdomen, becoming wider from base toward apex, and meeting down the center for most of their length. Median lobe of male genitalia large and thick (Fig. 3 E), the tegmen broad, but only about one-third as long as the median lobe. Length 3-5 mm.

This species is the type of the genus and is the smallest member, the average being somewhat less than *abdominalis* or *insularis*. May be known from all the others by its yellow or reddish abdomen. Taken in San Diego, Ventura, and San Luis Obispo Counties, California.

ENDEODES ABDOMINALIS (Lec.)

Body black, with the head, prothorax, scutellum, and base of elytra ferruginous. Prothorax much wider near apex than at base (Fig. 3 N). Elytra (Fig. 3 K) nearly as long as the abdomen and more expanding apically than in *basalis*. Male genitalia (Fig. 3 A) with large, thick median lobe, and broad tegmen nearly one-half as long as the median lobe. Length 3-6 mm.

May be distinguished by its red head and red basal portion of elytra with abdomen black. Taken in San Diego, Los Angeles, Ventura and San Luis Obispo Counties, California.

Endeodes insularis Blackwelder, n. sp.

Head nearly equilateral, reddish. Prothorax reddish, decidedly wider than long (Fig. 3 P). Elytra entirely reddish, one-third the length of the abdomen or less (Fig. 3 J), and meeting down the center for about half their length. Median lobe of male genitalia long and very slender; the tegmen very large and wide, over half as long as median lobe and almost completely surrounding it for one-quarter of its length (Fig. 3 F). Length 3-6 mm.

Holotype, female, (No. 3610, Mus. Calif. Acad. Sci.), collected by V. W. Owen, June 20, 1910, on San Miguel Island, California. Allotype, male, same data, author's collection. Paratypes, six females and three males, same data, and one

male from Prince Island, California, collected by E. P. Van Duzee, June 29, 1919.

Distinguished by its black elytra and pale legs.

ENDEODES COLLARIS (Lec.)

Fig. 1 A. Body entirely black except for the prothorax. Head (to base of labrum) shorter than wide; prothorax decidedly wider than long, rectangular (Fig. 3 M). Elytra (Fig. 3 I) black, less than one-third the length of the abdomen, and not meeting along the center except just behind the black scutellum. Pygidium of female rounded behind, not distinctly emarginate (Fig. 3 H). Genitalia of male rather slender, median lobe not expanded, tegmen rather narrow but nearly half as long as the median lobe (Fig. 3 B, D). Length 5-7 mm.

This is our commonest species. It is distinguished by its black head and dark legs. It is common from Monterey County to Marin County in California, and has been found in Washington.

Endeodes rugiceps Blackwelder, n. sp.

Head almost entirely reddish; the elytra reddish and the pygidium of the female broadly emarginate behind (Fig. 3 G). Elytra, prothorax, and male genitalia as in *collaris*. Length 5-8 mm.

Holotype, female, (No. 3611, Mus. Calif. Acad. Sci.), collected by L. S. Slevin, March 25, 1923, at Carmel, Monterey County, California. Allotype, male, taken by the author at San Remo Beach, fifteen miles south of Carmel, California, July 24, 1931, in the author's collection. Paratypes, nine females and four males, from Monterey County and Point Loma, San Diego County, California.

This species resembles *collaris* closely, but may be known at once by its red head. It is apparently rather rare on beaches in Monterey County, California. There is one specimen labelled Point Loma, San Diego County, California, in the Van Dyke collection.

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Endeodes insularis Blackwelder, new species.

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Endeodes rugiceps Blackwelder, new species.

A NEW WORK ON THE ELATERIDÆ

The California Academy of Sciences recently has published an important entomological paper by Dr. E. C. Van Dyke on the North American Elateridæ.¹ In this work of 175 pages Dr. Van Dyke has characterized one new genus, sixty-six new species and twelve new subspecies or varieties. It is principally a treatise on eleven genera, including some of the larger and more obscure of those found north of Mexico. For each of these genera the author has given us a key to the species, a synonymical catalogue of the species with references to the literature, descriptions of such new species as were available to him, and critical notes on many of the more obscure forms. The genera so treated are: *Conoderes*, *Elater* (in part), *Megapenthes*, *Anchastus*, *Limonius*, *Elathous*, *Athous*, *Ludius*, *Euthysanius*, *Plastocerus* and *Aplastus*. The new genus is *Parædostethus*, related to *Hypnoidus*, with one new species. Certain other genera are treated more or less briefly.

For many years Dr. Van Dyke has given this family of beetles special attention so he not only had a great amount of material before him, but, what was of equal importance, he had the background of field experience by which to judge of taxonomic values, the results of which are given us in these pages. Altogether it is one of the most valuable contributions to a knowledge of our North American Coleoptera that has appeared in a long time.—E. P. Van Duzee.

¹ Miscellaneous studies in the Elateridæ and related families of the Coleoptera. *Proceedings of the California Academy of Sciences, Series 4, Vol. XX, No. 9, pp. 291-465, March 3, 1932. Price \$1. For sale by the Academy.*